CLAIMS

1. A process for removing a solvent from a first solution, said process comprising

positioning a selective membrane between the first solution and a second solution having a higher osmotic potential than the first solution, such that solvent from the first solution passes across the membrane to dilute the second solution, and

extracting solvent from the second solution,

wherein the membrane has an average pore size of at least 10 Angstroms, and

wherein the second solution contains solute species that are too large to pass through the pores of the membrane.

2. A process as claimed in claim 1, wherein solvent is extracted from the second solution by a membrane and/or a thermal separation method.

3. A process as claimed in claim 2, wherein solvent is extracted from the second solution by at least one of ion exchange, electro-dialysis, nanofiltration, reverse osmosis, multi-stage flash distillation, multi-effect distillation, mechanical vapour compression, rapid spray desalination, crystallization and reverse osmosis.

4. A process as claimed in any one of the preceding claims, wherein the solute species in the second solution comprises at least one cationic species and/or at least one anionic species that is larger than the average pore size of the membrane.

5. A process as claimed in any one of the preceding claims, wherein the second solution is an aqueous solution comprising at least one of magnesium sulfate ($MgSO_4.6H_2O$ or $MgSO_4.7H_2O$), sodium sulfate ($Na_2SO_4.10H_2O$), calcium chloride ($CaCl_2.2H_2O$ or $CaCl_2.6H_2O$), potassium alum ($24H_2O$), disodium hydrogenphosphate ($Na_2HPO_4.12H_2O$), glucose, fructose and/or sucrose.

6. A process as claimed in claim 5, wherein the second solution further comprises at least one of sodium chloride and/or potassium chloride.

7. A process for removing a solvent from a first solution, said process comprising

positioning a selective membrane between the first solution and a second solution having a higher osmotic potential than the first solution, such that solvent from the first solution passes across the membrane to dilute the second solution, and

recovering solvent from the second solution by a technique selected from bio-desalting, precipitation, multi-stage flash distillation, multi-effect desalination, mechanical vapour compression, rapid spray desalination, crystallization and nanofiltration.

8. A process as claimed in any one of the preceding claims, wherein the membrane has an average pore size of 10 to 80 Angstroms.

9. A process as claimed in claim 7, wherein the membrane is a semi-permeable membrane having an average pore size of less than 10 Angstroms.

10. A process as claimed in any one of claims 7 to 9, wherein the second solution is an aqueous solution comprising at least one of magnesium sulfate ($MgSO_4.6H_2O$ or $MgSO_4.7H_2O$), sodium sulfate ($Na_2SO_4.10H_2O$), calcium chloride ($CaCl_2.2H_2O$ or $CaCl_2.6H_2O$)), potassium alum ($24H_2O$), disodium hydrogenphosphate ($Na_2HPO_4.12H_2O$), glucose, fructose, sucrose, sodium chloride and potassium chloride.

11. A process as claimed in any one of the preceding claims, wherein the second solution is of a known composition.

12. A process as claimed in any one of the preceding claims, wherein the solvent of the second solution is the same as the solvent of the first solution.

13. A process as claimed in any one of the preceding claims, wherein the solvent of the second solution is water.

14. A process as claimed in any one of the preceding claims, wherein the first solution is a waste stream from an industrial or agricultural process or a domestic water stream.

15. A process as claimed in any one of claims 1 to 13, wherein the first solution is a saline solution.

16. A process as claimed in claim 15, wherein the saline solution is seawater or brackish water.

17. A process as claimed in any one of the preceding claims, wherein the solvent passing from the first solution passes to the second solution raises the pressure of the second solution.

18. A process as claimed in claim 17, wherein said elevated pressure is used to assist in the extraction of solvent from the second solution in subsequent process steps.

19. A process as claimed in any one of the preceding claims, wherein after solvent from the first solution passes across the membrane to dilute the second solution, the diluted second solution is contacted with one side of a further selective membrane and a further solution having a higher osmotic potential than the diluted second solution is contacted with the other side of the membrane, such that solvent from the diluted second solution passes across the membrane to dilute the further solution.

20. A process as claimed in any one of the preceding claims, wherein the second solution contains an additive selected from anti-scaling agents, corrosion inhibitors, anti-fouling agents and disinfectants.

21. A process as claimed in claim 20, wherein said second solution is circulated in a closed loop, such that said additives are reused.

22. An apparatus for removing a solvent from a first solution, said apparatus comprising

a housing comprising a selective membrane for separating a first solution from a second solution having a higher osmotic potential than the first solution, said membrane being configured to selectively allow solvent to pass from the first solution-side of the membrane to the second solution-side of the membrane,

a unit selected from a multi-stage flash distillation, multi-effect desalination unit, a mechanical vapour compression unit, a rapid spray desalination unit, crystallization unit and a nanofiltration unit, and

means for coupling said housing to said unit.